

#### (4) Other Suppliers of Basic Slag

334. The other United Kingdom producers of basic slag are Richard Thomas & Baldwins Ltd., as suppliers from their Cwmfelin works,\* and Stanhope Lime and Limestone Co. Ltd., Bishop Auckland. In each case the slag supplied is of open-hearth origin. The slag produced at Cwmfelin consists for the most part of 7 and 8 per cent. grade and is sold to agricultural merchants, principally in the West Wales area. Stanhope Lime and Limestone Co. Ltd. has ground and supplied basic slag since February, 1957. The raw slag, of 6 to 10 per cent.  $P_2O_5$  content, is obtained from Consett Iron Company Ltd., and the product is sold to merchants and farmers. Supplies from these sources amounted to 7,303 tons in 1956-57 and 13,066 tons in 1957-58. The prices charged are generally in line, grade for grade, with those charged by B.B.S. Another steel producer marketed basic slag on a small scale until December, 1954, when production was discontinued on account of the difficulty of marketing the low grade produced.

335. In Northern Ireland imported basic slag is distributed by a number of fertiliser manufacturers and merchants who purchase their requirements from the Diamond Fertiliser & Chemical Co. Ltd., the agent for the Continental suppliers. Supplies amounted to 20,683 tons in 1956-57 and 24,503 tons in 1957-58.

### CHAPTER 10.

#### THE SUPPLY OF COMPOUND FERTILISERS (Class (f))

336. More than half of the chemical fertilisers consumed in the United Kingdom are in the form of compounds. The relationship in 1957-58, in tons of product and of nutrient content, is shown in the table below;† in terms of selling price the proportion attributable to compounds would be higher.

	Product	N	$K_2O$	$P_2O_5$ water soluble	$P_2O_5$ other
All Chemical Fertilisers ...	4,202,981	315,310	[299,573]	245,038	141,169
Compound Fertilisers ...	2,365,815	185,576	299,573	218,537	32,064

\* Open-hearth basic slag has been supplied from Cwmfelin since 1911. The company's basic Bessemer slag from its Ebbw Vale works is sold to Corby Basic Slag Ltd. (see paragraph 321 above).

† The figures in these two tables are provided by the Agricultural Departments and derived from returns by farmers of deliveries to them. Broadly speaking, they cover fertilisers within our terms of reference, but as regards the figures for "all chemical fertilisers" in the first table it should be noted that (1) deliveries of Nitra-Shell, which is not within our reference, are included, and (2) no returns are obtained for deliveries of potash for straight use, which are, therefore, excluded. As regards the tonnages of compounds delivered, the differences between these figures and those given in paragraph 21 are such as might be expected, the figures above representing deliveries to consumers as notified by the consumers and those in paragraph 21 sales by manufacturers, importers, etc. to their immediate customers, generally merchants. As regards the tonnage figures for "all chemical fertilisers", these are not comparable with the aggregate of the tonnage figures for the six classes of fertilisers given in paragraph 21 since the latter include, in respect of classes (a), (b) and (c), sales to compounders.

The proportion for compounds is rather less than it was in 1953-54 when, out of a total of 3,478,780 tons of fertiliser consumed, 2,025,980 tons were in compound form; this is due in part to the increased use of straight nitrogenous fertilisers, but may also be affected by the higher degree of concentration of compounds. The consumption of compounds over the intervening years and their average composition can be shown as follows:\*

Year	1953-54	1955-56	1956-57	1957-58
Tons of Product ... ..	2,025,980	2,267,888	2,253,191	2,365,815
Tons of N... ..	135,023	166,417	169,339	185,576
Tons of K <sub>2</sub> O ... ..	216,927	264,723	276,583	299,573
Tons of P <sub>2</sub> O <sub>5</sub> :				
(water soluble)... ..	176,970	206,580	205,197	218,537
(insoluble) ... ..	34,348	35,117	32,236	32,064

The principal suppliers of compound fertilisers are Fisons Ltd. (Fisons), Imperial Chemical Industries Ltd. (I.C.I.) and Scottish Agricultural Industries Ltd. (S.A.I.).

### (1) *Fisons Limited*

#### *Production*

337. Fisons manufactures the following categories of compound fertilisers for agricultural use: (1) high grade† granular compound fertilisers: (2) single-strength compounds in granular and powder form and P.M.P.; including a range of organic-inorganic powder compounds sold under the brand name "De Pass". In addition Fisons manufactures a wide range of horticultural fertilisers comprising inorganic compounds in powder and granular form and organic-inorganic compounds. The works at which the various types of compounds were manufactured in 1957-58 are shown in Appendix 7. In so far as our description of Fisons' arrangements in this Chapter refers to compounds based on ammonium nitrate, it should be noted that the marketing of these products is only now commencing.

#### *Materials and sources*

338. The materials used for Fisons' production of inorganic compounds are ammonium sulphate and, since June, 1959, ammonium nitrate; potassium chloride and potassium sulphate; single and triple superphosphate; and phosphate rock. The organic materials used for organic-inorganic compounds include hop waste, fish meal, bone and hoof manure, dried blood and sewage sludge. Fisons obtains some ammonium sulphate (in 1957-58 rather more than 10 per cent. of its requirements) from its subsidiary, Nitrogen Fertilisers Ltd., and a little from other sources, but the bulk is purchased from I.C.I. as agent for the members of the British Sulphate of Ammonia Federation Ltd. (B.S.A.F.) (see Chapter 7). Potash is purchased mainly from Potash Ltd. and Propane Fertilisers Ltd. (see Chapter 8). Fisons manufactures the single and triple superphosphate and ammonium nitrate it requires. The arrangements for the purchase of phosphate rock and the production of superphosphate are described in paragraphs 296, 297 and 308. The manufacture of ammonium nitrate is carried out at Stanford-le-Hope. The production is based on anhydrous

\* See footnote † on page 105.

† Described in price lists before 1958-59 as "high analysis".

ammonia which is supplied "over the fence" by the Shell Chemical Co. Ltd.\* Ammonium nitrate is produced in hot concentrated solution which is stored in stainless steel tanks and transported to Avonmouth and Immingham in special rail tank cars or road tankers.

#### *High grade compounds*

339. Fisons' high grade or high analysis compounds are all made in granular form and comprise the "30" and the "40" ranges; the analyses and prices of the various kinds which were supplied in England and Wales in 1958-59 are shown in Appendix 8. As will be seen the total nutrient contents of the three-nutrient compounds varied from 30 to 38 per cent. A principal constituent of the "30" and the "40" ranges is triple superphosphate. Since 1st July, 1959, ammonium nitrate has been used in nitrogen-bearing "40" compounds.† A number of the compounds in the "30" and "40" ranges are also made with additional boron, Aldrin or Tecane. Fisons describes its business as "essentially based on the supply of compounds", follows a policy designed to encourage the application of fertilisers in the form of granulated compounds and since 1952 has increasingly changed over to the production of more concentrated compounds. Until 1957 the most concentrated of these—No. 31—contained 33 units of plant food; in that year No. 41, containing 38 units, was marketed, and in 1958-59 No. 47, containing 14 units of  $P_2O_5$ , 28 of  $K_2O$ , and no nitrogen, was first introduced. We have described in paragraphs 184 to 187 the considerations which led Fisons to base its initial production of concentrated compounds in 1952 on triple superphosphate and the later developments which led to the manufacture of ammonium nitrate for the purpose of producing more highly concentrated compounds. In 1957-58 over 92 per cent., by tonnage, of Fisons' total sales of compounds were accounted for by sales of the "30" and "40" ranges.

#### *Single-strength compounds*

340. Fisons' single-strength inorganic compounds comprise a "National No. 1" compound in granular form containing 24.5 units per cent. of plant food, five other compounds in powder form containing from 21.75 to 27 units and P.M.P., containing 30 units of plant food. The demand for these compounds is quite small and the range has been reduced in recent years. "De Pass" powder compounds, made from organic and inorganic constituents, are also regarded as falling within the single-strength class. They are made in a wide range of varieties but the total quantity supplied is small, amounting to a little over 8,000 tons in 1957-58.

#### *Horticultural compounds*

341. Fisons manufactures compound fertilisers for market gardens, glass-houses, domestic gardens, parks and sports grounds. They include inorganic compounds in powder and granular form and organic-inorganic compounds in powder form. The range is wide and has tended to increase somewhat over recent years.

\* Nitric acid is also supplied. Some of the ammonia is converted to nitric acid and ammonium nitrate is manufactured by processes similar to those described in the case of I.C.I. in paragraph 38.

† Two additions to the "40" range were made on July 1st, 1959, viz. No. 42 with analysis 16 N: 9  $P_2O_5$ : 9  $K_2O$ , and No. 49 with analysis 14 N: 6  $P_2O_5$ : 20  $K_2O$ . Nos. 32 and 39 were withdrawn from the same date.

### *Distribution and sales*

342. Certain compounds (identical in composition with some of Fisons' own brands) are sold, for the most part direct to farmers, under the brand name "George Hadfield" through Fisons' subsidiary, George Hadfield & Co. Ltd., while horticultural fertilisers are sold through Fisons' horticultural sales department, some of them to retail shops for resale to the general public. The great bulk of Fisons' sales of compound fertilisers are made to merchants, including other manufacturers buying as merchants, and co-operative societies. The arrangements are similar to those described in respect of single superphosphate for straight use in paragraph 299. Prices are quoted for 6-ton lots with extras for smaller quantities. In England and Wales they include delivery to the nearest station; the collection allowance is 14s. 0d. per ton. In Scotland prices are quoted ex works and in Northern Ireland f.o.t. or f.o.l. at main port. Prices in England and Wales in 1958-59 for three-nutrient high grade compounds were in the range £23 12s. 6d. to £34 5s. 0d. per ton and for single-strength compounds (other than "De Pass") in the range £19 5s. 0d. to £20 19s. 6d. per ton. The basis of calculation of these price variations, and the relation between the ex works prices for Scotland and f.o.t. prices in Northern Ireland and the delivered prices for England and Wales are described in Chapter 13. The following early delivery rebates are given:

<i>Month of delivery</i>	<i>Rebate per ton</i>	
	s.	d.
July ... ..	30	0
August ... ..	30	0
September ... ..	27	6
October ... ..	25	0
November ... ..	22	6
December ... ..	12	6
January ... ..	10	0

The merchants' commission is 22s. per ton on single-strength compounds and 22s. 6d. on high grade compounds; large buyers (generally those taking over 1,000 tons per year) are given a large buyers' discount of 2s. 6d.

343. Fisons' total sales of its own compound fertilisers amounted to 995,909 tons in 1956-57 and 1,017,853 tons in 1957-58; these included 874,924 tons of high analysis compounds in the former year and 919,877 tons in the latter. A further analysis of sales in 1957-58 may be shown as follows:

<i>Single-strength compounds</i>		<i>Tons</i>
Granular <sup>(1)</sup> ... ..	...	42,274
Powder <sup>(2)</sup> ... ..	...	31,030
High analysis compounds (all granular) <sup>(3)</sup> ... ..	...	919,877
Horticultural compounds ... ..	...	24,672
<b>Total</b>		<b>1,017,853</b>

<sup>(1)</sup> Includes 7,904 tons "George Hadfield" compounds.

<sup>(2)</sup> Includes 13,726 tons "George Hadfield" compounds and 8,089 tons "De Pass" compounds.

<sup>(3)</sup> Includes 84,833 tons "George Hadfield" compounds.

## *(2) Imperial Chemical Industries Limited*

### *Production*

344. The principal compound fertiliser manufactured by I.C.I. is the "Concentrated Complete Fertiliser", C.C.F. No. 1A, but the company also now produces an N.K. fertiliser (Kaynitro). Both are in granulated form. As explained in paragraph 116, I.C.I. formerly produced a range of C.C.F.'s and other compounds, but during the war and up to 1954-55 it made only one C.C.F. (No. 1, containing 12N, 12P, 15K); this has since been replaced by C.C.F. No. 1A, containing 12N, 12P, 18K.

345. I.C.I. manufactures C.C.F. No. 1A at its Billingham works. Of the materials used ammonia, ammonium sulphate and sulphuric acid are all produced by I.C.I. Potassium chloride is obtained mainly from Potash Ltd. The phosphate rock used is Moroccan 75-77 per cent. grade and is obtained from the Comptoir des Phosphates (see paragraph 98). The company pays substantially the same price as other purchasers in the United Kingdom and obtains a similar invoice rebate in consideration of its buying only from the Comptoir. I.C.I., as an associated charterer, uses the shipping arrangements negotiated by the Phosphate Rock Agency Ltd. (see paragraph 101).

346. Kaynitro is a granulated mixture of ammonium sulphate, potassium chloride and some ammonium nitrate, with the nutrient content N.K.16:16 and was first marketed on a commercial scale in 1959.

### *Distribution and sales*

347. I.C.I. sells C.C.F. directly only to its agents in England and Wales.\* No C.C.F. is supplied to Northern Ireland. Prices include delivery to the farmer's nearest station on the mainland of England, Wales and Scotland, for minimum 6-ton lots in bags for prompt cash. Extra charges are made for smaller quantities, for delivery to farm and for credit. Cash discounts are now allowed for prompt payment. Deliveries are mainly by rail, although customers can collect material in their own lorries from the producing works or stores in which case an allowance is made. Occasionally coastwise shipments are made. As in the case of ammonium sulphate prices are quoted embodying an "early delivery rebate"; the top seasonal price for C.C.F. (from January to June) is £1 10s. 0d. per ton higher than the lowest price (July). In 1958-59 the top seasonal price per ton was £31 15s. 0d. The agents' commission is now 27s. 6d. per ton. Up to 1956-57 C.C.F. was also sold through merchants, whose commission was 11s. per ton less than that allowed to agents. S.A.I.'s commission in 1957-58, the last year in which it held the agency for sales in Scotland, was 36s. per ton. I.C.I.'s sales of C.C.F. amounted to 217,992 tons in 1956-57 and 245,690 tons in 1957-58.

## *(3) Scottish Agricultural Industries Limited*

348. The manufacture of compound fertilisers by S.A.I. measured in tons amounted in 1956-57 and 1957-58 to about 62 per cent. and 64 per cent. respectively of the company's total tonnage of finished and saleable fertilisers. The compounds comprise a wide range, in both powder and

\* Before 1958-59, S.A.I. was I.C.I.'s agent for sales of C.C.F. in Scotland. I.C.I. says that no sales are now planned in Scotland, where S.A.I. will now supply the market from its own production of C.C.F.'s.

granulated form, based on single superphosphate and also from July, 1957, a number of granulated C.C.F.'s (by 1958-59 there were four), based on ammonium phosphate. The range of compounds based on single superphosphate is associated with variations in local requirements and local trading traditions. There are consequent variations in the analysis (often slight) and in the number of the compounds offered by S.A.I.'s various branch offices. As a result of the introduction of C.C.F.'s, production of superphosphate-based compounds has declined by over a third in the last two years and the range has been reduced. The four C.C.F.'s have the respective N, P, K contents of 12:12:18\*; 13.5:13.5:13.5; 10:26 (including 6 insoluble  $P_2O_5$ ):10; and 15:10:10.

349. Granulated compounds based on single superphosphate have been made since the war at S.A.I.'s six main works but are now made in only three of them. Fertilisers in powder form are made at some of their works and also, in relatively small quantities by simple mixing, at seven of their other premises. The C.C.F.'s are made at the company's reconstructed plant at Leith. The raw materials for these and the other compounds produced by S.A.I. are ammonium sulphate obtained from I.C.I.; ammonia liquor, partly synthetic material obtained from I.C.I. and partly by-product material from the Scottish Gas Board; phosphate rock obtained from Nauru, North Africa† and Florida; potassium chloride and potassium sulphate obtained principally from Potash Ltd.; single superphosphate which the company manufactures itself; and sulphuric acid, of which the company makes the bulk of its requirements.

#### *Distribution and sales*

350. In addition to sales of its own compounds, S.A.I. sells compounds bought from other producers. Until the summer of 1957, it was I.C.I.'s agent for Scotland for the sale of the latter's C.C.F.; sales of compounds bought from other producers amounted in 1957-58 to a little over 3,500 tons and were obtained principally from another Scottish producer.

351. Delivery of compounds is made from the company's three main works and seven smaller mixing centres or through its fertiliser stores; in the case of compounds bought from other manufacturers, delivery is from their works. About two-thirds of sales are made direct to farmers, the balance going through agricultural merchants, co-operatives and other manufacturers. S.A.I.'s ordinary compounds are normally sold at ex works prices, though in some areas delivered farm prices are quoted. Its C.C.F.'s are sold on the basis of delivery to the farm in minimum 1-ton lots or of delivery to the nearest station in minimum 6-ton lots, the price being 10s. per ton less in the latter case. An allowance of 10s. per ton is also made for sales made ex store. Early delivery rebates are allowed on the basis of a difference of 30s. between the highest and lowest seasonal price. In 1958-59 S.A.I.'s ex works prices for its ordinary compounds containing three nutrients were in the range of £20 12s. 6d. to £23 5s. 0d. per ton. Its delivered price for C.C.F. No. 1 was £32 5s. 0d. per ton, or 10s. more than the price of I.C.I.'s C.C.F. which has the same nutrient content. In

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\* The same as I.C.I.'s C.C.F.

† See paragraph 302.

quoting for superphosphate-based compounds local offices are allowed some discretion to vary prices and terms in order to meet competition.

352. The merchants' commission is now not less than 16s. per ton on S.A.I.'s ordinary compounds, subject to negotiation. On C.C.F.'s it is normally not less than 25s.

353. S.A.I.'s sales of compounds in recent years have been as follows:

<i>Compounds</i>		
	<i>1956-57</i> <i>tons</i>	<i>1957-58</i> <i>tons</i>
Ordinary Compounds ... ..	222,177	171,463
Own C.C.F.'s ... ..	—	76,814
C.C.F. from I.C.I. ... ..	22,744	1,249
Compounds from other manufacturers ...	3,150	3,575

#### (4) *Other Producers of Compound Fertilisers*

354. There are about one hundred other manufacturers of compound fertilisers. Fifty-eight of these are members of the Fertiliser Manufacturers' Association Ltd. (F.M.A.) and twelve are also members of the Superphosphate Manufacturers' Association Ltd. (S.M.A.) and manufacture superphosphate. A short description of nine of the larger producers—all members of the F.M.A.—has been given in paragraphs 89 and 91; with one exception the compounds produced by these companies are principally, or entirely, inorganic compounds. The other producers consist of the remaining 49 members of the F.M.A.; five co-operative societies; seven members of the Association of British Organic Fertilisers Ltd. (A.B.O.F.); and a number of miscellaneous small producers. The supplies for which these various groups were responsible in 1956-57 and 1957-58 may be summarised as follows:

<i>F.M.A. members<sup>(1)</sup>:</i>		<i>1956-57</i>	<i>1957-58</i>
the nine largest ... ..		404,663	423,761
the rest ... ..		337,716	357,781
		<hr/> 742,379	<hr/> 781,542
A.B.O.F. members <sup>(2)</sup> ... ..		3,130	3,457
Co-operative societies <sup>(3)</sup> ... ..		52,357	49,634
Miscellaneous producers <sup>(1)</sup> ... ..		22,000	19,000
		<hr/> 819,866	<hr/> 853,633

<sup>(1)</sup> Principally inorganic compounds.

<sup>(2)</sup> Organic-inorganic compounds.

<sup>(3)</sup> Inorganic compounds.

Nearly all of these compounders have some merchanting business in other fertilisers.

#### *Production*

355. The inorganic compounds these manufacturers produce are for the most part based on single superphosphate, but at least twelve producers are now making more concentrated compounds incorporating triple superphosphate and one company, as mentioned in paragraph 89, is making compounds based on imported diammonium phosphate. In recent years two

companies have manufactured compounds containing 38 units of plant food and one company makes a compound containing 41 units. The larger compounders offer a range of products in powder and granular form. A few producers make only granular compounds and a few only powder. A number of producers make P.M.P. Some of the leading horticultural fertiliser producers prescribe fertiliser mixtures ad hoc for particular requirements.

#### *Materials*

356. Ammonium sulphate is obtained principally from the B.S.A.F.; smaller quantities are obtained from by-product producers outside the Federation and, in the case of West Norfolk Fertilisers, from Nitrogen Fertilisers Ltd. A few compounders have in recent years bought imported ammonium sulphate either because of occasional shortage or because they wished to export compounds and were accordingly unable to use B.S.A.F. sulphate so long as the terms of sale for the latter included the provision referred to in paragraph 261. Most compounders obtain their potash from Potash Ltd., but a few buy from the other available sources. Those compounders who are also producers of single superphosphate provide primarily for their own requirements but may, on occasion, sell to, or buy from, others. Fisons is the principal source of triple superphosphate but three companies manufacture their own requirements. Phosphate rock is obtained through the Phosphate Rock Agency Ltd., except that one compound manufacturer buys direct from the Comptoir des Phosphates (see paragraphs 99-100).

#### *Distribution and sales*

357. The larger of these producers sell agricultural compound fertilisers chiefly to merchants but a few sell mainly or entirely to farmers. The smaller producers generally sell directly to farmers. Prices are commonly quoted on the basis of delivery to the farm, but a few producers quote both "delivered" and "ex works", in the latter case principally to merchant customers; some quote ex works with extra charges for delivery to station or farm, according to the distance involved; a few quote "delivered nearest station". Allowances from the delivered price are generally made for collection ex works or, in some cases, from the nearest station. Horticultural fertilisers are commonly supplied through retail shops or, on occasion, direct to users.

358. So far as comparison is possible, having regard to the varying composition of compounds, the prices charged for agricultural compound fertilisers have in recent years generally been in line with those charged by Fisons. The most concentrated of the fertilisers now produced is a little dearer than C.C.F. in terms of its total nutrient content. Commissions and allowances to merchants show some variation as between one product and another, ranging from a few shillings to nearly £2 per ton, and in at least one case they are negotiated with each customer. Where there is direct selling to farmers, they may receive quantity allowances for large orders though this does not appear to be general. At least one compounder gives a 10s. per ton discount to potato growers. Cash discounts vary as do the settlement periods during which they may be claimed, and a special charge is often made for long credit. Extra charges are made for sales of less than 6-ton lots and early delivery rebates are commonly given. The scale of both charges and rebates in recent years has been in line with those of Fisons.